



## PIER Energy System Integration Program Area

### Airport Solutions

**Contract #:** 100-98-001 **Project #:** 2

**Contractor:** Electric Power Research Institute (EPRI)

**Subcontractors:** Hawaiian Electric Company, Inc.: Carey Transportation: Henry C. Larry

**Project Amount:** \$128,000

**Match Amount:** \$428,610

**Contractor Project Manager:** Layla Sandell (650) 850-2756

**Commission Contract Manager:** McKinley Addy (916) 657-0833

**Status:** Completed

#### Project Description:

The purpose of this project is to develop new environmental and energy technologies and apply existing technologies, such as electric vehicles, to airport infrastructure to reduce pollution and subsequent costs. In addition, the project will develop improvements to airport efficiency, productivity and safety. Commercial airports are microcosms of all sectors of the electricity marketplace, are major energy users, and are of vital importance to the economic health of their surrounding community. The contribution to local and regional economies from California's largest airports is hundreds of millions dollars every year. However, airports face new and ongoing challenges. Citizens in surrounding communities question the impacts of airports on their quality of life. Reducing overall pollutant emissions from airport facilities has become a high priority issue. These issues could limit airport growth and in turn impact local and regional economies.

Converting ground transportation and other airport equipment to electricity is one solution to these issues. Inside terminals, the installation of electrically powered equipment can improve indoor air quality, reduce HVAC system operating costs, and prevent disruptions in power quality-sensitive equipment. Outside terminals, the use of electrified equipment and vehicles can provide annual operating cost savings exceeding \$500,000. In addition, emission reductions of up to 80 percent could be expected at airports that convert much of their ground transportation and equipment to electricity. EPRI's Airport Solutions Target has developed the necessary methodologies and models to assess the feasibility of electrification and the associated economic and environmental benefits on an airport-specific basis. Through the development and deployment of electrotechnologies, sustainable growth of airports will be enhanced, and energy savings will be attained.

#### This project supports the PIER Program objectives of:

- Improving the energy cost/value of California's electricity by providing information on efficiency improvements available for use by airports.
- Improving the environmental and public health costs/risks of California's electricity by reducing emissions from the internal combustion engines used by airport facilities by encouraging replacement with electrically-powered equipment.

#### Proposed Outcome:

1. Provide information on energy solutions to support the improvement and growth of California airports.

**Actual Outcomes:**

1. Information on energy solutions for airports.

- EPRI organized a pioneering project to electrify American Airlines airport ground support equipment (GSE) at Detroit Metro Airport. This first-of-its-kind project electrified 132 pieces of GSE by the end of 2000, and is scheduled to electrify the airline's entire fleet of 1070 vehicles over the next five years. Case study results were published.
- EPRI hosted an Electric Ground Support Equipment Market Penetration Issues Round Table in June 2000 in Sacramento, CA. The meeting brought together more than 40 representatives of California airports, airlines, vehicle and component manufacturers, a standards-making body, and utilities to address key issues. A proceeding of the meeting was published. A second round table was held in October 2000 at LaGuardia Airport.
- The latest information was received from the FAA's Inherently Low-Emission Vehicle (ILEV) pilot program, which seeks to achieve environmental benefits through the use of low-emission vehicles.
- A life-cycle cost-evaluation model and spreadsheet were developed to compare life-cycle costs of electric versus internal combustion-based GSE fleets under different scenarios of operation, thereby assessing the economic benefits of the cleaner airport vehicles.
- EPRI participated in the planning of a GSE Data Collection Project with Southern California Edison to meter equipment and collect performance, battery management, and metering data.
- EPRI participated in the planning of a 12-month Power Quality Impact Study involving the characterization of electric GSE charging systems.
- Information was provided on the environmental benefits of ozonation of cooling towers at an airport in Shreveport, Louisiana.
- EPRI participated in the National Electric Vehicle Association Infrastructure Working Council (IWC) GSE connector standardization meetings to develop functional specifications for electric GSE connectors, thereby providing a supporting infrastructure for electric GSE, and ensuring safety and reliability of fast charging.

**Project Status:**

The Commission's participation in this target ended December 31, 2000.